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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/589,355

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Takashi Akiyama

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EXAMINER

MOON, SEOKYUN

ART UNIT

PAPER NUMBER

2629

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,355	Applicant(s) AKIYAMA, TAKASHI	
	Examiner SEOKYUN MOON	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/8/06&4/22/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. The Applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d) based on an application filed in Japan on February 12, 2004 has been acknowledged.

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statements (IDS) filed on April 22, 2008 and November 08, 2006 have been acknowledged and considered by the Examiner. Copies of the form PTO-1449 are included in this correspondence.

Claim Objections

3. **Claim 13** is objected to because of the following informalities:

While claim 1 on which claim 13 depends discloses an element supplying power as a power supply section, claim 13 discloses the element as the power supply.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 3, 4, 6, and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over JP Pub. No. 2002-289374 by Yamazaki et al. (herein after Yamazaki) in view of U.S. Patent No. 5,793,163 by Okuda.

As to **claim 1**, Yamazaki teaches a light source driving circuit [drawing 1 and pg 2, the description of the drawing 1] comprising:

a light source section [drawing 1, “103”];

a charge section [drawing 1, “104”];

a power supply section [drawing 1, “101”] for charging the charging section;

a switching section [drawing 1, “102”] for connecting the charging section (“104”) to the power supply section (“101”) or to the light source section (“103”); and

a control section [drawing 1, “105”] for controlling the switching section (“102”) so as to connect the charging section (“104”) to the power supply section (“101”), thereby charging the charging section, and so as to disconnect the charging section from the power supply section and connect the charging section to the light source section (“103”), thereby causing the light source section to emit light [pg 11 par. (0023) and par. (0024)].

Yamazaki teaches that the power supply section includes a voltage source [drawing 1, “101”), but does not teach that the power supply section includes a constant-current circuit.

However, Okuda teaches the concept of serially connecting a constant-current circuit [fig. 10, “3”) to a voltage source [fig. 10, “1”), to provide power to a light source section [fig. 10, “2”).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light source driving circuit of Yamazaki to serially connect a constant-current circuit to the voltage source such that the combination of the voltage source and the constant-current circuit provides power to the light source section, as taught by Okuda, in order to change the driving current supplied to the light source section into a constant current [Okuda: col. 1 lines 19-23] and thus to stabilize the operation of the light source driving circuit.

Yamazaki as modified by Okuda teaches that the charging section is charged via the constant-current circuit because, in the modified light source driving circuit of Yamazaki, a constant-current circuit is placed between the light source section [Yamazaki: drawing 1, "103"] and the voltage source [Yamazaki: drawing 1, "101"].

As to **claim 3**, Yamazaki as modified by Okuda teaches that the switching section [Yamazaki: drawing 1, "102"] includes a first switch [Yamazaki: drawing 2, "201"] and a second switch [Yamazaki: drawing 2, "202"], wherein the power supply section [Yamazaki: drawing 1, "101"] is connected to the charging section [Yamazaki: drawing 1, "104"] via the first switch and the light source section [Yamazaki: drawing 1, "103"] is connected to the charging section via the second switch.

As to **claim 4**, Yamazaki as modified by Okuda teaches that the first switch [Yamazaki: drawing 2, "201"] and the second switch [Yamazaki: drawing 2, "202"] each have a control terminal (the gates of "201" and "202") and the first switch and the second switch are controlled so as to conduct cyclically and in an alternating drive by a control signal [Yamazaki: drawings 1 and 2, the signal applied to the node "S"] that the control section [Yamazaki: drawing 1, "105"] applies to the each control terminal [Yamazaki: pg 10 par. (0020) lines 11-14].

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As to **claim 6**, Yamazaki as modified by Okuda teaches that the charging section [Yamazaki: drawing 1, “104”] includes a driving capacitor [Yamazaki: pg 10 par. (0020) line 8].

As to **claim 7**, Yamazaki as modified by Okuda teaches that the light source section [Yamazaki: drawing 1, “103”] includes a light-emitting diode [Yamazaki: pg 10 par. (0020) lines 14-17].

6. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki and Okuda as applied to claims 1, 3, 4, 6, and 7 above, and further in view of the Applicant’s Admitted Prior Art (herein after AAPA).

Yamazaki as modified by Okuda teaches that a non-emitting period [Yamazaki: drawing 1 and pg 10 par. (0020) lines 11-14, the period during which the power supply section “105” outputs the signal having the state of L] which includes a period during which the charging section is connected to the power supply section for charging is set equal to an emitting period [Yamazaki: drawing 1 and pg 10 par. (0020) lines 11-14, the period during which the power supply section “105” outputs the signal having the state of H] during which the light source section is caused to emit light.

Yamazaki as modified by Okuda does not teach that the non-emitting period is set longer than the emitting period.

However, AAPA teaches a light source driving circuit [fig. 14a] and the concept of setting the non-emitting period of the light source driving circuit to be longer than the emitting period of the light source driving circuit [fig. 14b].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light source driving circuit of Yamazaki as modified by Okuda to set the

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non-emitting period of the light source driving circuit to be longer than the emitting period of the light source driving circuit, as taught by AAPA, in order to provide sufficient time for charging the charging section of the light source driving circuit.

7. **Claims 8-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki and Okuda as applied to claims 1, 3, 4, 6, and 7 above, and further in view of U.S. Publication No. 2004/0017342 by Sekine.

As to **claim 8**, Yamazaki as modified by Okuda teaches that the light source section includes a single light source [Yamazaki: drawing 1, “103”].

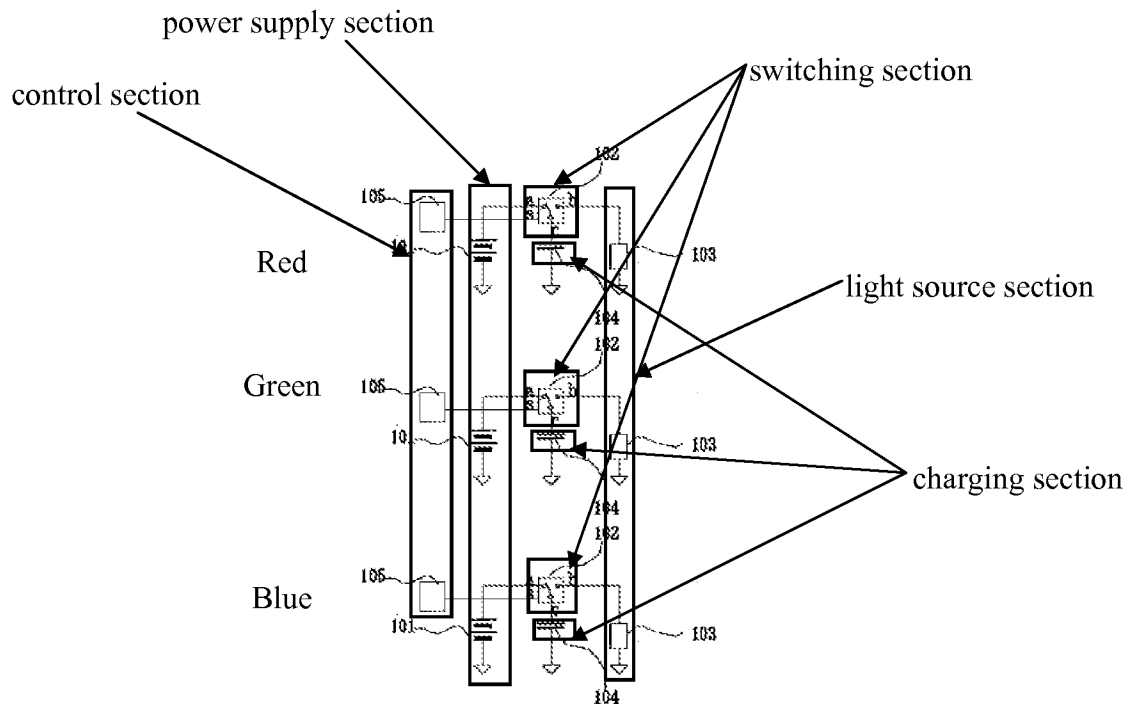
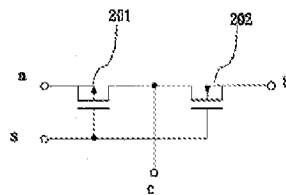
Yamazaki as modified by Okuda does not teach that the light source section includes a plurality of light sources.

However, Sekine teaches the concept of using three light sources [figs. 1 and 5, “RLED”, “GLED”, and “BLED”] for emitting different color lights (i.e. red, green, and blue) as a backlight for a display, wherein the three light sources are activated sequentially to emit the different color lights sequentially [par. (0055)].

Since the light source driving circuit of Yamazaki as modified by Okuda is also used as a backlight for a display [Yamazaki: pg 7 par. (0002)], it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light source section of Yamazaki as modified by Okuda to include three light sources emitting different color lights (i.e. red, green, and blue) and a light source driving circuit for each of the light sources and to activate the three light sources sequentially, in order to provide a field sequential driving type color display which does not require color filters and thus to improve the color quality of the display.

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Drawing 1 provided below shows the light source driving circuit of Yamazaki as modified above. Drawing 2 of Yamazaki is reproduced below for the Applicant's convenience. Please note that the drawing 2 is a detailed structure of the element "102" shown on drawing 1.

Drawing 1Drawing 2

As to **claim 9**, Yamazaki as modified by Okuda and Sekine teaches that the switching section includes a first switch [drawings 1 and 2 above, "201" for red light source driving circuit], a second switch [drawings 1 and 2 above, "202" for red light source driving circuit], a third switch [drawings 1 and 2 above, "202" for green light source driving circuit], and a fourth

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switch [drawings 1 and 2 above, “202” for blue light source driving circuit] and the power supply section [drawing 1 above] is connected to the charging section [drawing 1 above] via the first switch, the first light source [drawing 1 above, “103” for red light source driving circuit] is connected to the charging section via the second switch, the second light source [drawing 1 above, “103” for green light source driving circuit] is connected to the charging section via the third switch, and the third light source [drawing 1 above, “103” for blue light source driving circuit] is connected to the charging section via the fourth switch.

As to **claim 10**, Yamazaki as modified by Okuda and Sekine teaches that the first switch [drawings 1 and 2 above, “201” for red light source driving circuit], the second switch [drawings 1 and 2 above, “202” for red light source driving circuit], the third switch [drawings 1 and 2 above, “202” for green light source driving circuit], and the fourth switch [drawings 1 and 2 above, “202” for blue light source driving circuit] each have a control terminal (the gate of “202”) and the first switch, the second switch, the third switch, and the fourth switch are controlled so as to conduct cyclically and in an alternating drive by a control signal that the control section applies to the each control terminal [Sekine: fig. 5] (Note that Yamazaki teaches the concept of activating the light source section by supplying the control signal to the switching section and Sekine teaches the concept of activating a plurality of light source sections sequentially. Thus, Yamazaki as modified by Sekine teaches the concept of activating the plurality of light source sections sequentially by supplying the control signal to the switching sections sequentially.).

As to **claim 11**, Yamazaki as modified by Okuda and Sekine teaches that the power supply section includes a constant-current circuit, and wherein the power supply section charges

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the charging section via the constant-current circuit, as discussed with respect to the rejection of claim 1.

As to **claim 12**, Yamazaki as modified by Okuda teaches that the light source section includes a single light source [Yamazaki: drawing 1, “103”].

Yamazaki as modified by Okuda does not teach that the light source section includes a plurality of light sources.

However, Sekine teaches the concept of using three light sources [figs. 1 and 5, “RLED”, “GLED”, and “BLED”] for emitting different color lights (i.e. red, green, and blue) as a backlight for a display, wherein the three light sources are activated sequentially to emit the different color lights sequentially [par. (0055)].

Since the light source driving circuit of Yamazaki as modified by Okuda is also used as a backlight for a display [Yamazaki: pg 7 par. (0002)], it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light source section of Yamazaki as modified by Okuda to include three light sources emitting different color lights (i.e. red, green, and blue) and a light source driving circuit for each of the light sources and to activate the three light sources sequentially, in order to provide a color display not requiring color filters and thus to improve the color quality of the display.

Drawing 1 provided above shows the light source driving circuit of Yamazaki as modified above.

As shown on drawing 1 provided above, Yamazaki as modified by Okuda and Sekine teaches that the charging section [drawing 1 above] includes a first driving capacitor [drawing 1 above, “104” for red light source driving circuit] corresponding to the first light source, a second

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driving capacitor [drawing 1 above, “104” for green light source driving circuit] corresponding to the second light source, and the third driving capacitor [drawing 1 above, “104” for blue light source driving circuit] corresponding to the third light source.

As to **claim 13**, Yamazaki as modified by Okuda and Sekine teaches that the switching section [drawing 1 above] includes a first switch [drawings 1 and 2 above, “201” for red light source driving circuit], a second switch [drawings 1 and 2 above, “201” for green light source driving circuit], a third switch [drawings 1 and 2 above, “201” for blue light source driving circuit], a fourth switch [drawings 1 and 2 above, “202” for red light source driving circuit], a fifth switch [drawings 1 and 2 above, “202” for green light source driving circuit], and a sixth switch [drawings 1 and 2 above, “202” for blue light source driving circuit], and that the power supply section is connected to the first driving capacitor via the first switch, the power supply section is connected to the second driving capacitor via the second switch, the power supply section is connected to the third driving capacitor via the third switch, the first light source is connected to the first driving capacitor via the fourth switch, the second light source is connected to the second driving capacitor via the fifth switch, and the third light source is connected to the third driving capacitor via the sixth switch.

As to **claim 14**, Yamazaki as modified by Okuda and Sekine teaches that the first switch, the second switch, the third switch, the fourth switch, the fifth switch, and the sixth switch each have a control terminal [drawing 2 above, each of the gates of “201” and “202”] and the first switch, the second switch, the third switch, the fourth switch, the fifth switch, and the sixth switch are controlled so as to conduct cyclically and in an alternating drive by a control signal that the control section applies the each control terminal (Note that Yamazaki teaches the

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concept of activating the light source section by supplying the control signal to the switching section and Sekine teaches the concept of activating a plurality of light source sections sequentially. Thus, Yamazaki as modified by Sekine teaches the concept of activating the plurality of light source sections sequentially by supplying the control signal to the switching sections sequentially.).

As to **claim 15**, Yamazaki as modified by Okuda and Sekine teaches that the power supply section includes a constant-current circuit [Okuda: fig. 10, “3”] and the power supply section charges the first driving capacitor, the second driving capacitor, and the third driving capacitor via the constant-current circuit (Note that, in the light source driving circuit of Yamazaki as modified by Okuda, a constant-current circuit is placed between the light source section and the voltage source and thus the capacitors are charged via the constant-current circuits.).

As to **claim 16**, Yamazaki as modified by Okuda and Sekine teaches a lighting apparatus using the light source driving circuit [Yamazaki: pg 18 the last two lines].

As to **claim 17**, Yamazaki as modified by Okuda and Sekine teaches a display apparatus using the light source driving circuit [Yamazaki: pg 18 the last two lines].

As to **claim 18**, Yamazaki as modified by Okuda and Sekine teaches a field sequential color liquid crystal display apparatus using the light source driving circuit [Yamazaki: pg 18 the last two lines and Sekine: par. (0004) lines 1-4].

As to **claim 19**, Yamazaki as modified by Okuda and Sekine teaches an information appliance using the light source driving circuit [Yamazaki: pg 18 claims 14 and 15].

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Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEOKYUN MOON whose telephone number is (571)272-5552. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on 572-272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

June 16, 2010
/Seokyun Moon/
Examiner, Art Unit 2629